



Orthopedics

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Strength Training for the Shoulder

This handout is a guide to help you safely build strength and establish an effective weight-training program for the shoulder.

Starting Your Weight Training Program

- Start with three sets of 15-20 repetitions
- Training with high repetition sets ensures that the weights that you are using are not too heavy.
- To avoid injury, performing any weight training exercise to the point of muscle failure is not recommended.
- “Muscle failure” occurs when, in performing a weight training exercise, the muscle is no longer able to provide the energy necessary to contract and move the joint(s) involved in the particular exercise.
- Joint, muscle and tendon injuries are more likely to occur when muscle failure occurs.
- Build up resistance and repetitions gradually
- Perform exercises slowly, avoiding quick direction change
- Exercise frequency should be 2 to 3 times per week for strength building
- Be consistent and regular with the exercise schedule

Prevention of Injuries in Weight Training

- As a warm-up using light weights, you can do the rotator cuff and scapular strengthening program (see next page)
- Follow a pre-exercise stretching routine (see next page)
- Do warm-up sets for each weight exercise
- Avoid overload and maximum lifts
- Do not ‘work-through’ pain in the shoulder joint
- Stretch as cool-down at end of exercise
- Avoid excessive frequency and get adequate rest and recovery between sessions.
- Caution: Do not do exercises with the barbell or dumbbell behind the head and neck. For shoulder safety when working with weights, you must always be able to see your hands if you are looking straight ahead.

Return to Weight Training After Shoulder Surgery

Your doctor or therapist should test your motion and strength and give you clearance before you start weight training.

Criteria:

- Full, pain-free range of shoulder motion
- Normal strength in the rotator cuff and scapular muscles



Exercises and rehabilitation

Your doctor or physical therapist will instruct the appropriate stretching and strengthening exercises. It is recommended that you do not begin shoulder exercises without proper instruction and exercise selection based upon your particular set of shoulder circumstances.

Shoulder Stretching Program

The stretching exercises are intended to improve or maintain normal flexibility and range of motion of the shoulder. 1 or 2 of each stretch should be done before weight training (after warming up) and 3 to 5 of each stretch should be done after finishing your workout. Each stretch should be held for 10 to 15 seconds in a static fashion without bouncing or oscillation. Stretching should be done gently, without pain.

Shoulder stretching exercises can be found online on the MGH Sports Medicine website:
http://www2.massgeneral.org/sports/protocols_therapy_sportsconditioning.html

Shoulder Strengthening Program

Theraband Strengthening for the shoulder

These resistance exercises should be done very slowly in both directions. The goal is to achieve a maximum amount of strengthening while listening to your end-point of pain. Work within a pain free range of motion at all times and do the exercises very slowly. The slower the motion, the better the muscle contraction is throughout the range of movement.

Shoulder theraband exercises can be found online on the MGH Sports Medicine website:
http://www2.massgeneral.org/sports/protocols_therapy_sportsconditioning.html

Rotator Cuff and Scapular Strengthening Program

The rotator cuff and scapular exercises are intended to isolate the essential muscles of the shoulder that provide strength to the rotator cuff and control the scapula (shoulder blade). Each exercise should be done for one set of 15 repetitions prior to a weight training workout or 2-3 times a week for good shoulder strength and muscle balance. Weights used with these exercises can be built up gradually in increments of no more than 1 pound per week, with a safe limit of 5 lb.

Rotator cuff and scapular exercises (Shoulder 12 Strengthening Program) can be found online on the MGH Sports Medicine website:

http://www2.massgeneral.org/sports/protocols_therapy_sportsconditioning.html

Weight Training Program

The following upper body and shoulder strength program is usually safe and provides a good basic foundation of upper body and shoulder strength when combined with the basic shoulder strength and stretch program outlined earlier. The strength program can be followed 2 to 3 times a week. 3 sets of 10 to 15 repetitions can be done for each exercise. You can follow the principles of PRE and RM as outlined in the next section to know when to increase weights in programs where the goal is to increase strength.

Exercise Machines with Free Weight Counterpart Exercises

1. Biceps curl machine or free weight biceps curl
2. Triceps machine or free weight triceps exercise



3. Chest press machine or bench press
4. Seated row machine or bent over dumbbell rows
5. Cable pull down in front of chest or pull ups
6. Shoulder press machine with forward grip or military press

Weight Training Exercises to Avoid

The following weight training exercises should always be avoided to help prevent injury to the shoulder:

- Pull downs behind-the-neck (wide-grip)
- Behind-the-neck shoulder press
- Wide-grip bench press
- Standing lateral deltoid raises
- Triceps press overhead
- Chest fly exercises

Precautions for Specific Exercises

Pull downs

- Perform exercise in **front** of the head, to the chest, with a medium width (not wide) grip. Palm-up grip is the safest.

Bench Press

- Your grip should be no wider than the width of your shoulders. This is usually 17 to 18 inches.
- Grip is made measuring between the knuckles of the index fingers.
- Grip with the palm facing you is the safest.

Military Press (Press Overhead)

- Overhead exercises are very stressful to the rotator cuff and shoulder ligaments, especially when done with the weight behind the neck or head.
- Start and finish overhead presses in front of the shoulder.

Lateral Deltoid Raises

- Should be avoided due to the impinging and wearing effect on the rotator cuff.
- Lateral raises from the prone or bent over position can be done as a substitute for standing lateral deltoid raises.

Forward Raises

- Perform exercise in the “thumb-up” position. It is usually safer and can be done with reasonable weights. Do not use a palm down grip.

Incline Bench Press

- There is a danger of shoulder dislocation if the lifter loses control of the weight behind the head.
- Always have a spotter for removing and replacing the barbell in this exercise.
- Using dumbbells is more risky for losing control of the weight and causing injury.



Supine Chest Fly Exercise

- Do not do any chest-fly exercise if your elbows are straight. Always allow the elbows to bend.
- Never lower your hands (holding dumbbells) below the level of your chest.

“Pec Deck” Exercise

- If you are using a “Pec-Deck” machine, never let the weight stretch the arms so that your elbows pass behind your chin.
- You can set the arms on this machine a few clicks forward to adjust the maximum motion allowed.

Parallel Bar Dips

- If you are performing “dips” using a set of parallel bars, never lower yourself below the point where the elbows reach a 90° angle.

Triceps Exercises

- For triceps exercises, triceps pushdowns on a pulley system are safe as well as bent-over triceps extensions.
- Avoid overhead triceps exercises.

Upright Row Exercise

- Keep your grip at least 12 inches apart.
- When pulling the bar upward toward the chin, do not raise the bar higher than the point at which the elbow reaches shoulder level.

Strength Training Principles

Progressive Resistance Exercise (PRE) Principle

- To build muscle strength and size, the amount of resistance used must be gradually increased.
- The exercises should be specific to the target muscles
- The amount of resistance should be measurable and gradually increased over a longer period of time
- To avoid excess overload and injury, the weight or resistance must be gradually increased in increments of 5 to 10 %
- Resistance can be increased gradually every 10 to 14 days when following a regular and consistent program
- Adequate rest and muscle recovery between workout is necessary to maximize the benefit of the exercise
- If the PRE principle is followed too strictly, the weights potentially will go higher and higher.
- At a certain point, the joints and muscles will become overloaded and injury will occur.
- This eventuality can be avoided by refraining from using excessive weight during strength training.



Repetition-Maximum Principle

Knowing when to increase the weight you are using in a strength-training program is based upon the 'repetition-maximum' (RM) principle. For example, a 10 RM for the leg press exercise is the amount of weight that can be lifted "just 10 times", and no more, before fatigue or failure sets in. That is, the particular weight being lifted is so heavy that an 11th repetition is not possible.

In a typical strength improvement program, the workout might look like this:

Exercise: Chest press

Intensity: 10 RM

10 RM Weight (Determined by trial): 100 pounds

Set 1: 1/2 10 RM (50 lb.) 10 repetitions

Set 2: 3/4 10 RM (75 lb.) 10 repetitions

Set 3: 10 RM (100 lb.) Up to 10 repetitions

Set 4: 10 RM

Set 5: 10 RM

1. If 10 repetitions of 100 lb is achieved on the third set, then the 10 RM can be raised by 5 lb for the next set/exercise session.
2. If 10 repetitions are not achieved on the third set, then the 10 RM weight remains the same (100 lb) for the next workout or any subsequent sets.
3. If you reached the 10 RM on the third set, and wished to do a 4th and 5th set, then the weight can be raised to the new 10 RM.
4. If you did not reach the 10 RM on the 3rd set, then the 4th and 5th sets would remain at the original 10 RM.
5. The $\frac{1}{2}$ and $\frac{3}{4}$ RM set should always be done to gradually ramp-up the weight to the 10 RM set(s).
6. The 3rd, 4th and 5th sets are considered the 'working sets.'
7. The number of repetitions you choose for your RM will depend upon the goals of your strength training program:

15 to 20 RM Builds muscle size and definition

8 to 10 RM Builds muscle size and force capability (pure strength)

3 to 5 RM Builds maximal force capability, minimal size gains (high power)

Returning to High Intensity Training

- If your goal is returning to high level weight training or weight lifting, it will take over six months of cautious, gradual progression to return to top form.
- In general, avoid increasing the amount of weight lifted by more than 10-15% (at a time) of your present working weight every 10-14 days.

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